

23. The Institute and SPIE: The International Society for Optical Engineering

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The Society of Photographic Instrumentation Engineers (SPIE) was founded on July 1, 1955 to support the applications of photo-optical instrumentation. The initial core of this effort was really range instrumentation, but it quickly broadened out to cover more and more important technologies and engineering endeavors. It was clear in these early days that SPIE was not a traditional technical society, i.e., one that is inclined to be run by and for the members. Instead SPIE was dedicated to technology transfer and to the support of the users of the science, technology and instrumentation that its fields of interest encompassed.

The first award by the society was the “Karl Fairbanks Memorial Award” established in 1958. It is worthy of significant note that our own Rudolf Kingslake received that award in 1971 for service to industry. However, the involvement of the Institute and its members goes back further both directly and indirectly. My own personal involvement goes back to my days at Technical Operations, Inc. and started in 1963—the year that the society held its first technical seminar-type conference and published its first official proceedings. The subject was image enhancement.

Naturally the society needed a journal, and the first formal one was established in 1962 under the official title *Society of Photographic Engineers Journal*, or *SPIE Journal*. It came out as a bimonthly, and the December/January 1963/64 issue contained the first of the *Physical Optics Notebook* articles that George Parrent and I were invited to prepare. We continued that endeavor for sixteen consecutive issues. Later, SPIE reproduced those sixteen articles as a tutorial text. By the time this occurred I was already in place at the Institute as its director. Hence, the forward was written from my Institute address in October 1968. After several reprints of this book, a new and much-expanded version, with George Reynolds and John DeVelis as our lead co-authors, was co-published with the American Institute of Physics under the title, *The New Physical Optics Notebook: Tutorials in Fourier Optics* (1989).

The society’s journal has gone through a series of changes from *Society of Photographic Instrumentation Engineers Journal* to *Society of Photo-Optical Instrumentation Engineers Journal* to *Journal of SPIE* in 1971. A major and very significant change took place in the journal in 1972 when Douglas Sinclair of the Institute accepted the editorship with a mandate to re-think the journal, including its name, the format, the process, etc. With great insight Doug suggested that the journal should be called *Optical Engineering*, and so it is to this day. His vision for it has certainly been realized as successive editors have built on those solid foundations set in 1972.

Not long after *Optical Engineering* was launched, the society established the Kingslake Medal and Prize for the most noteworthy paper to appear in the journal. The long list of recipients contains many distinguished scientists and engineers with a strong association with the Institute—and we are very proud of their accomplishments.

Because The Institute of Optics was part of the College of Engineering and Applied Sciences and because its mission was to cover the discipline of optical science and engineering, it was important for the leadership of the Institute to play significant roles in a number of professional societies. The Optical Society of America clearly was of central importance to us and to Rochester in general, since the society owes its beginnings to The Association for the Advancement of Applied Optics founded in Rochester in 1915. Certainly SPIE was also of importance to us. The list of officers, directors, fellows and committee members over the years shows a record of our commitment and the commitment of our graduates. I did my share, including being elected president in 1975 and 1976, with indentured servitude both before and after those years. With most societies, being president for a year ends up being in office for five or six years depending on the succession rules!

Nineteen seventy-seven was an important year. SPIE moved its headquarters to Bellingham, Washington, its income reached one million dollars, the one-hundredth proceedings was published, and its two-thousandth member enrolled. (It is hard to believe it was ever that small when you look at today's numbers!) It was natural at this point in its history to establish the Gold Medal Award. Rudolf Kingslake was the fourth recipient in 1980, Robert E. Hopkins in 1983, and myself in 1986, plus a number of distinguished alumni, including most recently Robert Fischer (2000) and James Wyant (2003).

Over many years there was a constant discussion about the name of the society that almost from its launch was simply referred to as SPIE. Everyone realized that this name did not provide any information to the outside world. Many colleagues in other disciplines looked at you quizzically when they heard you say that you were going to a "spy" (SPIE) conference! But the name SPIE had a very special place in many people's hearts. Emotional attachments of this kind should not be ignored. So, the great compromise was "SPIE—The International Society for Optical Engineering." Success! Former (and long-term and very effective) executive director Joe Yaver will tell you who to blame (or applaud) for this new and now lasting name.

Successive annual meetings and other specialized programs became larger and larger as the engineering aspect of optics in general continued to evolve. The programs and the published proceedings show a significant involvement from faculty and students in the Institute and major commitments from our alumni. Many alumni held various positions in the society, up to the highest level of president (e.g. presidents Robert Shannon, 1979, 1980; Barry Johnson, 1987; Robert Sprague, 1991; Roland Jacobsson, 1998).

The society always stayed connected to its roots while expanding its horizons to encompass the rapidly expanding fields involving the application of optical science and technology in the service of the nation and the world commercial economy. Thus, it is not surprising that in 1982 SPIE was appointed the international Secretariat for the Fifteenth International Congress on High-Speed Photography and Photonics. SPIE had been responsible for publishing earlier proceedings.

It is interesting from the Institute's point of view that SPIE had from its early days an involvement with high-speed photography in the broadest sense. Gordon Milne was an early pioneer in this field, and the Institute's war effort made many important contributions to bomb test photography and streak photography that extended into the post-war era. Elsewhere in this volume, George Fraley recounts great stories from that immediate post-war era and tales of experiments conducted on his campsite as well as in and on top of the Institute in Bausch & Lomb Hall.

Personally I had a particular interest in this high-speed technology and in the commercial equipment developed from it. In part this arose because of the period I spent as

technical director of Beckman and Whitley (B&W), a division of Technical Operations Inc. “B&W,” as it was often called, was one of the leading manufacturers of high-speed cameras, both frame and streak.

During this short essay I have spent some time on the background that led to “SPIE—The International Society for Optical Engineering” taking an important role in the spectrum of professional technical and scientific societies. We in the Institute are pleased to have supported that activity, and it has supported us in our educational and research mission. For many years SPIE has had a significant program of short courses at its meetings and its Optical Engineering Press has published some excellent tutorial texts. The Institute’s involvement in these teaching and tutorial texts can be seen by scanning the list of authors of Optical Engineering Press volumes, and the topics and teachers of short courses at any meeting.

To end this essay—three other things of note that connect The Institute with SPIE. The first is again personal. Little did I know that when Joe Yaver, executive director of SPIE, and I discussed the need for a series of volumes of collected reprints of various sub-topics of optical science and engineering, that I would still be involved as series editor, some 170-plus Milestone Volumes later!

Emil Wolf is understandably not a major participant in SPIE; his tremendous strength is in the fundamental theory of our field and is thus aligned primarily with the field of physics. Nevertheless the impact of his work on many of us (both colleagues and students) has been profound as we pursue the implications and applications of his insights. His work has always had a theme of “optics in terms of observables.” As I write this paragraph, I have just returned from a two-day seminar at the annual meeting of SPIE. The seminar title was “Tribute to Emil Wolf: Engineering Legacy of Physical Optics.” A monograph



Robert Sprague (Ph.D. '71), SPIE President, presents the Conrady award to Rudolf Kingslake.

will be published on the papers presented at the meeting; I was proud to give the opening address.

The last of the three topics brings us back to Rudolf Kingslake, one of our first two faculty members in our Institute and to whom this volume is dedicated—in part, that is, as the other “part” is dedicated to his long-time partner, Hilda Kingslake. Both Hilda and Rudolf were both students of A. E. Conrady at Imperial College; Hilda, of course, was Conrady’s daughter. The Conrady name and tradition lives on through them. In 1990 SPIE presented the first Conrady Award to Rudolf and Hilda Kingslake. The presentation was made by the president of SPIE, Robert Sprague, a distinguished Institute alumnus, at the annual meeting in San Diego. Congratulations to all three of you, and to all the many others who have contributed to the well being of the Institute and SPIE.